



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/581,411

08/07/2006

Timothy Ramford Vittor

P/382-156

3753

2352 7590 04/16/2009  
OSTROLENK FABER GERB & SOFFEN  
1180 AVENUE OF THE AMERICAS  
NEW YORK, NY 100368403

EXAMINER

CHANG, LI WU

ART UNIT

PAPER NUMBER

2129

MAIL DATE

DELIVERY MODE

04/16/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,411	<b>Applicant(s)</b> VITTOR ET AL.	
	<b>Examiner</b> LIWU CHANG	<b>Art Unit</b> 2129	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24, 26-32, 34 and 36-45 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24, 26-32, 34, 36-45 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. This office action is responsive to amendment filed 02/27/2009 with the claim of foreign priority date 12/01/2003. Claims 1-24, 26-32, 34, 36-44 are amended. Claims 25, 33 and 35 are cancelled. Claim 45 is new. Claims 1-24, 26-32, 34, 36-45 are pending.

### ***Response to Arguments***

Applicant's arguments filed 02/27/2009 have been fully considered but they are not persuasive.

In re pgs 13-14, the argument is that references Ozawa and Seraji do not teach or suggest that "units act independently of and without reference to the target action of other units".

In response, the meaning of the phrase "units act independently of and without reference to the target action of other units" is ambiguous. The specification does not provide the term "independently of" or "without reference to" a definition, but describes it in two embodiments. In Pg 14, L 1-3, the specification describes the desired and actual positions of link (i+1) as the input parameters to link i. Obviously, the decision of actions made at link i is based at least in part on information transmitted from other links. Each link is dependent upon and with reference to other links and thus, independence among links does not hold. This embodiment is central to the instant application, and "the embodiment described herein relies on information being relayed from one link to the next" (Pg 12, L 18-20). Not that the claim does not specify what exactly the inputs to

Art Unit: 2129

each link are. Terms "the target outcome" and "the target action" are not further defined in the claim.

In Pg 12, L 15-18, the specification recites "each link may have a sensor which provides it with information regarding a reference position. In this way, each link may operate independently". However, this embodiment (referred to as the 2<sup>nd</sup> embodiment) is not further discussed in the specification and can only be regarded as a non-functional descriptive statement. In fact, such an embodiment is impractical and inoperable in real world applications. There is no discussion how critical factors, such as, extensive feedback control, adjustment, synchronization and collaboration, are implemented in the 2<sup>nd</sup> embodiment. The completion time of a task cannot be decided and completion cannot be assured. Additional materials are needed to ensure its validity. In the absence of supporting materials, the 2<sup>nd</sup> embodiment is considered to be not useful and lack of utility.

Ozawa discloses each link operate independently performs driving of the servomotor based on received information (C 7, L 60-67 and C 8, 1-20, L 8, L 20-25, or C 8, L 60-65).

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-24, 26-32, 34, 36-45 are rejected under 35 USC 101 the claimed invention is directed to non-statutory subject matter. Regarding claims 1, it is directed

Art Unit: 2129

to method. The court has said that there's a two-pronged test to determine whether a software of business method process patent is valid: (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing. In other words, pure software or business method patents that are neither tied to a specific machine nor change something into a different state are not patentable. *Ex parte Bilski*, Appeal No. 2007-1130 (Fed. Cir. October 30, 2008). Claim 1 does not specify the input to each link. In the claim, "the target outcome" is for the system. It is not clear whether the same or different target outcome is for each link. In the lack of clearly defined input, it fails the tie and transformation tests. Accordingly, claim 1 is not statutory. Claims 3 and 24 are directed to a method. Again, they fail the tests. Accordingly, they are not statutory. As to any claim not specifically discussed it is a dependent claim that is rejected for the reasons given above with respect to the claim(s) on which it depends.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-24, 26-32, 34, 36-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The specification fails to particularly point out the meaning of the features "independently of and without reference to".

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 18-23, 26, 32-33, 36-43 and 45 are rejected under 35 U.S.C. 102(e) as being anticipated by Ozawa et al. (US Patent No. 5,055,755), hereinafter **Ozawa**.

3. With respect to claim 1, Ozawa discloses a method for controlling a system comprising a plurality of interdependent units to achieve a target outcome, the method comprising the steps of:  
automatically establishing the target outcome for the system (**Ozawa**: in Fig 1, the manipulator is an example of a system of interdependent units, in Fig 17, the locus of motion, as of steps P1, ... P21, is an example of the target action);  
automatically establishing a target action for each interdependent unit of the plurality of interdependent units responsive to the target outcome (**Ozawa**: Fig 9, functions in the modules, such as “motor control program”, “motor fault countermeasure program” and “drive degree change program” describe each unit responsive to the outcome and independent action, or C 7, L 55-67 and C 8, L 1-5, L 20-25, “The CPU 54 sends the data”, “the CPU 46 produces drive control signal representative of the drive degree, drive speed and rive direction for the servomotor” or “In like manner, the second to the

Art Unit: 2129

fourth motor controllers 27 to 29 control the driving of the servomotor” implies automatically establishing a target action responsive to the target outcome).; and automatically actuating each interdependent unit of the plurality of interdependent units to perform the target action for the respective interdependent unit of the plurality of interdependent units (**Ozawa**: C 7, L 60-67 and C 8, L 1-25, “The drive control signals are fed to the motor drive circuit 51. Thus, the servomotor 12 is driven on the basis of the drive degree, drive speed and drive direction represented by the drive control signals. As has been described above, the encoder 17 detects the rotational degree and rotational direction of the servomotor 12 and feeds the data representative of the rotational degree and rotational direction back to the first motor controller 26. The output from the encoder 17 is converted by the potentiometer 17a to a signal which is easily processed by the CPU. Once again, the CPU 46 produces drive control signals so that the deviation between the fed-back data of the rotational degree and rotational direction, on the one hand, and the set data of the rotational degree and rotational direction, on the other, can be reduced to zero” implies automatically actuating units to perform the target action),

wherein in the automatic establishing of the target action for each interdependent unit, the target action is established independently of, and without reference to, the target action for any other interdependent unit of the plurality of interdependent units (**Ozawa**: C 8, L 20-25, “In like manner, the second to fourth motor controllers 27 to 29 control the driving of the servomotors in the joints 9 and 10” implies the target action is established

Art Unit: 2129

independently of, and without reference to, the target action for any other interdependent units).

4. With respect to claim 18, Ozawa discloses wherein the target outcome is automatically established in accordance with a spatial relationship of the system (**Ozawa**: Figs 18-21, “data of points”, “locus of motion” imply spatial relationship).

5. With respect to claim 19, Ozawa discloses wherein the target outcome is automatically established in accordance with a predetermined spatial relationship of the system relative to a target location (**Ozawa**: C 8, L 55-60, “locus of motion” imply an action of following the path which can be predetermined).

6. With respect to claim 20, Ozawa discloses wherein the target outcome is automatically established in accordance with a time consideration (**Ozawa**: Fig 14 shows the computation that is time dependent).

7. With respect to claim 21, Ozawa discloses wherein the target action automatically established in accordance with an adjusting the spatial position of that interdependent unit (**Ozawa**: C 2, L 49-51, “changing the control drive degree ...” imply adjusting the spatial position).



Art Unit: 2129

8. With respect to claim 22, Ozawa discloses wherein the adjustment is by way of movement of the interdependent unit and/or expansion or contraction of that interdependent unit (**Ozawa**: C 8, L 1-5, drive speed and direction imply the movement).

9. With respect to claim 23, Ozawa discloses wherein the target outcome determines the target position (**Ozawa**: Fig 16, "current position" implies outcome determining positions).

10. With respect to claim 26, Ozawa discloses a system comprising a controller operable to implement the method in accordance with Claim I (**Ozawa**: Figs 9-23 imply control methodologies).

11. With respect to claim 32, Ozawa discloses a processor-readable medium comprising a program of instructions executable on a computer, the instructions operable to perform the method of Claim 1 (**Ozawa**: C 1, L 25-30, describe such a program).

12. With respect to claim 36, Ozawa discloses a system comprising the plurality of interdependent units, the units being interdependent and operable to move relative to one another (**Ozawa**: Fig 1, a robot system implies being operable to move); at least one actuator operable to move the interdependent units (**Ozawa**: Fig 1, a robot system); and the control system being operable to impart instructions to the at least one actuator

Art Unit: 2129

for the automatic actuating of the interdependent units (**Ozawa**: Fig 1, a robot system implies the controller and CPU impart instructions to each actuator, as shown in Fig 2, according to control methodology as described in Figs 9-23).

13. With respect to claim 37, Ozawa discloses wherein the units of the plurality of interdependent units are interdependent by being in a predetermined spatial relationship (**Ozawa**: C 8, L 54-60, describe locus which can be predetermined).

14. With respect to claim 38, Ozawa discloses wherein each unit of the plurality of interdependent units are is physically interconnected to at least one other unit of the plurality of interdependent units (**Ozawa**: Fig 1)

15. With respect to claim 39, Ozawa discloses wherein the control system comprises a plurality of controllers each controller of the plurality of controllers positioned in a respective ones unit of the plurality of interdependent units, each controller ~ operable to impart instructions to the at least one actuator for the automatic actuating of the interdependent unit (**Ozawa**: Fig 1 shows different types of controllers operative to instructions).

16. With respect to claim 40, Ozawa discloses wherein each interdependent unit of the plurality of interdependent units is a constituent part of a robot (**Ozawa**: Fig 1 shows a robot system).

Art Unit: 2129

17. With respect to claim 41, Ozawa discloses wherein each constituent part is a module in the robot implemented as a robotic manipulator (**Ozawa**: Fig 1, wherein at least a segment with motor controller can be an example of a module).

18. With respect to claim 42, Ozawa discloses a system comprising a plurality of subsystems, each subsystem of the plurality of subsystems comprising the system according to Claim 36 (**Ozawa**: Fig 9 the execution of a program implies the control to impart instructions to some actuators).

19. With respect to claim 43, Ozawa wherein to achieve a target outcome, intermediate outcomes are automatically established for each subsystem of the plurality of subsystems, and wherein the control system coordinates movement of the plurality of subsystems by coordinating the intermediate outcomes for each subsystem (**Ozawa**: Fig 18, “receive data”, “find out joint angles between respective points”, Fig 20, “receive feedback data”, Fig 21, “fault” and “locus”, Fig 22, “locus calculation” and “lock angle”, and Fig 23, “transmit data through another controller” imply coordinating the intermediate outcomes for each subsystem).

20. With respect to claim 45, Ozawa discloses wherein each unit of the plurality of independent units is physically joined together directly or indirectly with at least one other unit of the plurality of interdependent units (**Ozawa**: Fig 1).

Art Unit: 2129

21. Claims 2-13, 24-25, 27-31, 34-35 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Ozawa**, in view of Seraji (US Patent No. 5414799), and hereinafter **Seraji**.

22. With respect to claim 2, Ozawa discloses wherein the target action for each interdependent unit is automatically established in response to a current position of at least one reference portion of the system relative to a target position (**Ozawa**: C 7, L 60-67 and C 8, L 1-5, “drive degree, drive speed and rive direction” imply the target action, and “the CPU 46 finds a deviation between the target position data and the angular a position data of the servomotor” imply the current position and the target position).

Ozawa fails to particularly call for the term “reference portion” in the limitation. Seraji discloses “the at least one reference portion” (**Seraji**: Abstract, L 18-22, the “frame of reference” and Figs 6-7, the reference coordinates are examples of reference portion). It would have been obvious for one of ordinary skill in the art at the time of invention to incorporate the reference frames, as disclosed by Seraji, into the parametric representation of Ozawa, because the reference frame is necessary to the control computation of a robotic system.

23. With respect to claim 3, Ozawa discloses a method for controlling a system comprising a plurality of interdependent units to achieve a target outcome, the method comprising the steps of:

Art Unit: 2129

automatically establishing the target outcome for the system, automatically establishing a target action for each interdependent unit of the plurality of interdependent units responsive to the outcome, wherein the target action for an interdependent unit of the plurality of interdependent units is automatically established in response to a current position of at least one reference portion of the system relative to a target position of the at least one reference portion (**Ozawa**: Fig 1, the manipulator is an example of a system of interdependent units, Fig 17, the motion locus, P1, ... P21 imply the target action, and Fig 9, functions given in modules, such as “motor control program”, “motor fault countermeasure program” and “drive degree change program” describe each unit responsive to the outcome and independent action, where C 7, L 60-67 and C 8, L 1-5, “drive degree, drive speed and rive direction” imply the target action, and “a deviation between the target position data and the angular a position data of the servomotor”, or C 7, L 55-67 and C 8, L 1-5, L 20-25, “The CPU 54 sends the data”, “the CPU 46 produces drive control signal representative of the drive degree, drive speed and rive direction for the servomotor” or “In like manner, the second to the fourth motor controllers 27 to 29 control the driving of the servomotor” implies the current position and the target position);

automatically actuating each interdependent unit of the plurality of interdependent units to perform the target action for the respective interdependent unit of the plurality of interdependent units (**Ozawa**: C 7, L 60-67 and C 8, L 1-25, “The drive control signals are fed to the motor drive circuit 51. Thus, the servomotor 12 is driven on the basis of the drive degree, drive speed and drive direction represented by the drive control

Art Unit: 2129

signals. As has been described above, the encoder 17 detects the rotational degree and rotational direction of the servomotor 12 and feeds the data representative of the rotational degree and rotational direction back to the first motor controller 26. The output from the encoder 17 is converted by the potentiometer 17a to a signal which is easily processed by the CPU. Once again, the CPU 46 produces drive control signals so that the deviation between the fed-back data of the rotational degree and rotational direction, on the one hand, and the set data of the rotational degree and rotational direction, on the other, can be reduced to zero" implies automatically actuating units to perform the target action),

wherein in the automatic establishing of the target action for each interdependent unit, the target action is established independently of, and without reference to, the target action for any other interdependent unit of the plurality of interdependent units (**Ozawa**: C 8, L 20-25, "In like manner, the second to fourth motor controllers 27 to 29 control the driving of the servomotors in the joints 9 and 10" implies the target action is established independently of, and without reference to, the target action for any other interdependent units).

Ozawa fails to particularly call for the term "reference portion" in the limitation. Seraji discloses "reference portion" (**Seraji**: Abstract, L 18-22, the "frame of reference" and Figs 6-7, the reference coordinates are examples of reference portion). It would have been obvious for one of ordinary skill in the art at the time of invention to incorporate the reference frames, as disclosed by Seraji, into the parametric representation of Ozawa, because the reference frame is necessary to the control

Art Unit: 2129

computation of a robotic system.

24. With respect to claim 4, Ozawa discloses wherein the automatic establishing of the target action for a-said each interdependent unit includes calculating a difference value between the current position of [[a]] said at least one reference portion and the target position of that the at least one reference portion, and using said difference value to establish said target action (**Ozawa**: C 7, 60-67, “deviation” implies the difference, and C 8, L 1-10, “the CPU 46 produces drive control signal representative of drive degree, drive speed and drive direction” imply using said difference value to establish said target action where C 8, L 10-25 describe the control). Seraji discloses the reference portion (**Seraji**: Abstract, L 18-22).

25. With respect to claim 5, Ozawa discloses automatically establishing an operation action for each interdependent unit (**Ozawa**: C 7, 60-67 and C 8, L 1-10 describe the steps of establishing operation actions), wherein the automatic actuating of each interdependent unit includes instructing each interdependent unit to initiate its the operation action. (**Seraji**: Figs 5-6 show the automatic actuating of each interdependent unit includes, or C 11, EQ 114 – EQ 120 show the initiation values).

26. With respect to claim 6, Ozawa discloses repeatedly iterating through the steps of the method to so as to automatically establish an updated operation action (**Seraji**: C 11, EQ 114 – EQ 120).

27. With respect to claim 7, Ozawa discloses wherein a rate of the iteration is constant throughout the system (**Ozawa**: Fig 15 shows the rate control which includes a constant rate).

28. With respect to claim 8, Ozawa discloses wherein a rate of the iteration varies among the interdependent units of the system (**Ozawa**: C 3, L 10-15, "... to detect the controller having the lowest operation rate in the next operation cycle" imply the various rate between units).

29. With respect to claim 9, Ozawa discloses wherein the operation action for at least some of the interdependent units of the plurality of interdependent units is the target action (**Ozawa**: L 3, L 1-10, "controller" is one of the units).

30. With respect to claim 10, Seraji discloses automatically establishing a constraint factor for the system, and automatically establishing a constrained action for a constrained interdependent unit of the plurality of interdependent units responsive to the constraint factor, wherein the constraint factor limits a range of target actions available to the constrained interdependent unit of the plurality of interdependent units. (**Seraji**: Fig 7, shows the constraint and C 11, EQ 114-120 show the solution with respect to constraints, the bounded inputs and outputs of EQ 114-120 implies limits of a range of target actions).



31. With respect to claim 11, Ozawa discloses wherein the operation action for the constrained interdependent unit is the constrained action (**Ozawa**: Fig 17, following the path trajectory is an example of constrained action).

32. With respect to claim 12, Ozawa discloses wherein only the constraint factor for the constrained interdependent unit are is utilised in the automatic establishing of the constrained action for that the constrained interdependent unit (**Ozawa**: C 7, L 60-67 and C 8, L 1-20 describe the constrain factor for each unit, where an exemplary constraint is the path planning, as in Fig 17).

33. With respect to claim 13, Ozawa discloses wherein the constraint factor relating to the constrained interdependent unit is utilised in establishing said constrained action for another said interdependent unit of the plurality of interdependent units (**Ozawa**: the unit 18 is an example of the unit and/or CPU 46).

34. With respect to claim 24, Ozawa discloses A method for controlling a plurality of interdependent units, the method comprising the steps of:  
automatically deriving an operation action responsive to starting information for each interdependent unit of the plurality of interdependent units (**Ozawa**: in Fig 1, the manipulator is an example of a system of interdependent units, in Fig 17, the locus of motion, as of steps P1, ... P21, is an example of the target action, or Fig 9, functions in the modules, such as "motor control program", "motor fault countermeasure program"

Art Unit: 2129

and “drive degree change program” describe each unit responsive to the outcome and independent action, or C 7, L 55-67 and C 8, L 1-5, L 20-25, “The CPU 54 sends the data”, “the CPU 46 produces drive control signal representative of the drive degree, drive speed and drive direction for the servomotor” or “In like manner, the second to the fourth motor controllers 27 to 29 control the driving of the servomotor” implies automatically establishing a target action responsive to the target outcome, or C7, L 60-67 and C 8, L 1-10 describe steps of deriving actions);

automatically actuating each interdependent unit of the plurality of interdependent units to perform the operation action for the respective interdependent unit of the plurality of interdependent units (**Ozawa**: C 7, L 60-67 and C 8, L 1-25, “The drive control signals are fed to the motor drive circuit 51. Thus, the servomotor 12 is driven on the basis of the drive degree, drive speed and drive direction represented by the drive control signals. As has been described above, the encoder 17 detects the rotational degree and rotational direction of the servomotor 12 and feeds the data representative of the rotational degree and rotational direction back to the first motor controller 26. The output from the encoder 17 is converted by the potentiometer 17a to a signal which is easily processed by the CPU. Once again, the CPU 46 produces drive control signals so that the deviation between the fed-back data of the rotational degree and rotational direction, on the one hand, and the set data of the rotational degree and rotational direction, on the other, can be reduced to zero” implies automatically actuating units to perform the target action),

wherein in the automatically deriving of the operation action for each interdependent

unit, the operation action is established independently of, and without reference to, the operation action for any other interdependent unit of the plurality of interdependent units (**Ozawa**: C 8, L 20-25, “In like manner, the second to fourth motor controllers 27 to 29 control the driving of the servomotors in the joints9 and 10” implies the target action is established independently of, and without reference to, the target action for any other interdependent units).

Ozawa fails to particularly call for the term “starting information” in the limitation, and “wherein the starting information is selected from a group comprising a target outcome, a target action, a constraint action and a reference position”. Seraji discloses “starting information” (**Seraji**: C 11, EQ 114-120 show starting information), and “wherein the starting information is selected from a group comprising a target outcome, a target action, a constraint action and a reference position” position (**Seraji**: C 11, EQ 114-120 and Fig 6 shows target actions, constraints a reference position and coordinates). It would have been obvious for one of ordinary skill in the art at the time of invention to incorporate the starting information, as disclosed by Seraji, into the parametric representation of the control system Ozawa, because starting information is necessary in the control.

35. With respect to claim 27, Ozawa discloses a sensor operable to collect information regarding a presence of a constraining factor for determining a constraint action for at least a constrained interdependent unit of the plurality of interdependent units (**Ozawa**: Figure 1, unit 19 is an example of a sensor).

36. With respect to claim 28, Ozawa discloses an actuating system operable to actuate the plurality of interdependent units (**Ozawa**: Fig 1, functions of “motor controller” imply actuate the plurality of interdependent units).

37. With respect to claim 29, Ozawa discloses wherein each interdependent unit of the plurality of interdependent units is a constituent part of a robot (**Ozawa**: Fig 1 shows constituent parts).

38. With respect to claim 30, Ozawa discloses wherein each constituent part is a module in the robot implemented as a robotic manipulator (**Ozawa**: Fig 9 shows control modules for each constituent part).

39. With respect to claim 31, Ozawa discloses control means operable to switch a control methodology of the system to a centralised control methodology in which all interdependent units of the plurality of interdependent units are centrally controlled (**Ozawa**, C 7, L 7-13, “CPU 54 of the hand motor controller” carries out centralized control methodology).

40. With respect to claim 34, Ozawa discloses a processor-readable medium comprising a program of instructions executable on a computer, the instructions

operable to perform the method of Claim 3 (**Ozawa**, Fig 1, or Fig 9 implies a processor perform the method).

41. With respect to claim 35, Ozawa discloses a computer readable medium incorporating a computer program in accordance with Claim 34 (**Ozawa**: Fig 9 implies the execution according to stored program).

42. With respect to claim 44, Ozawa discloses “wherein the automatic establishing of the target action for said the interdependent unit involves calculating a difference value between the current position of a reference portion of said at least one reference portion and the target position, and using said difference value for the automatic establishing of said target action” (**Ozawa**: C 7, L 60-67 and C 8, L 1-5, “drive degree, drive speed and rive direction” imply the target action, and “the CPU 46 finds a deviation between the target position data and the angular a position data of the servomotor” imply the current position and the target position). Seraji discloses reference portion (**Seraji**: Abstract, L 18-22, the “frame of reference” and Figs 6-7, the reference coordinates are examples of reference portion).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIWU CHANG whose telephone number is 571-270-3809. The examiner can normally be reached on 8:30AM - 6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Vincent can be reached on 571-272-3080. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LIWU CHANG

Application/Control Number: 10/581,411  
Art Unit: 2129

Page 22

Examiner  
Art Unit 2129

March 30, 2009

/David R Vincent/

Supervisory Patent Examiner, Art Unit 2129